

EGG QUALITY ENRICHMENT USING UNCONVENTIONAL VEGETAL FEED IN LAYERS' DIET

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Even though egg is considered „nature’s perfect food”, especially due to its high protein concentration of great biological value (essential amino acids profile) and high digestibility of nutrients contained, fear of cholesterol represents a barrier to the evolution of the average individual consumption. As a result there is an effervescence among researchers to obtain eggs with a reduced cholesterol content compared to standard egg. Among the ways used to lower egg cholesterol, dietary supplementation of laying hens with polyunsaturated fatty acids (PUFA) is included. In this context for seven weeks a study on 120 hens Lohmann Brown (55 weeks of age) was performed to determine whether the presence of camelina and flaxseed meals (PUFA omega 3 enriched forages), determine an quality improvement of the egg. The birds were divided into 3 groups (C, E1, E2), housed in enriched cages. The basic structure of the diet was the same for all three groups. The difference between experimental diets and control diet was given by the inclusion of camelina and flaxseed meals in E1 diet (2% camelina meal +5% flaxseed meal) or E2 diet (5% flaxseed meal), respectively. Every three weeks, a number of 18 eggs/group were collected randomized, of which 6 samples/group (3 eggs/sample) were formed to determine the quality of eggs (physical parameters, cholesterol and fatty acids content).

The results showed that in the diets, PUFA ratio: omega 6/omega-3 was 22.83 in C group, 4.785 in E1 group and 5.385 in E2 group. The concentration of α -linolenic acid (C18:3n3) in diets was: 1.35% fat (C), 8.18% fat (E1), 7.23% fat (E2). Yolk and whites weight did not differentiate between groups. In contrast, in group C, eggshell weight (0.41 ± 0.01 mm) was significantly ($P\leq 0.05$) higher than in E2 (0.349 ± 0.026 mm). There were no significant differences between groups in terms of yolk color, Haugh unit and the eggshell breaking strength. The content of α -linolenic acid (C18:3n3) in egg yolk was 0.403g/100g fat in C group, significantly ($P\leq 0.05$) lower than E1 (1.82g/100g fat) and E2 (1.87g/100g fat). Omega 6/omega 3 PUFA ratio at 100g of fat in the yolk was: 16.851 to C group significantly ($P\leq 0.05$) higher than 5.44 to E1 and 5.29 E2 groups, respectively. Cholesterol content (g/whole egg) registered in C (0.266 ± 0.025) was significantly ($P\leq 0.05$) higher than E1 (0.224 ± 0.028 mg/egg) and E2 (0.229 ± 0.01928 mg/egg).

Analysis of collected litter during the experiment showed that heavy metals concentration (Cu, Zn) did not differentiate between the 3 groups, therefore there is no danger in case of storing or their practical application as organic fertilizer.

We appreciate that using flaxseed meal alone (E2 diet) or together with camelina meal (E1 diet) an egg, with functional food properties, can be obtained.

Key words: eggs, quality, unconventional feed, fatty acids, cholesterol

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